



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/727,429	12/04/2003	Ghanashyam S. Mishra	8448-90969	6834

7590 04/06/2006  
Welsh & Katz, Ltd.  
120 South Riverside Plaza, 22nd Floor  
Chicago, IL 60606

EXAMINER
----------

RAETZSCH, ALVIN T

ART UNIT	PAPER NUMBER
----------	--------------

1754

DATE MAILED: 04/06/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	Application No. 10/727,429	Applicant(s) MISHRA ET AL.	
	Examiner Alvin T. Raetzsch	Art Unit 1754	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 02 December 2004.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-19 is/are pending in the application.
- 4a) Of the above claim(s) 18 and 19 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-17 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☒ Claim(s) 1-19 are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 02 December 2004 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>12/4/03</u> . | 6) <input type="checkbox"/> Other: _____  |

Art Unit: 1754

Restriction to one of the following inventions is required under 35 U.S.C. 121:

- I. Claims 1-17, drawn to a process and apparatus for the production of carbon black, classified in class 423, subclass 456.
- II. Claims 18-19, drawn to a carbon black product, classified in class 423, subclass 44.1.

The inventions are distinct, each from the other because of the following reasons:

1. Inventions I and II are related as process/apparatus of making and product made. The inventions are distinct if either or both of the following can be shown: (1) that the process as claimed can be used to make another and materially different product or (2) that the product as claimed can be made by another and materially different process (MPEP § 806.05(f)). In the instant case the product as claimed is a carbon black with a low surface area. Carbon blacks with low surface areas can be made, for instance, by a process/apparatus that employs only axial and radial injection.

Because these inventions are independent or distinct for the reasons given above and have acquired a separate status in the art in view of their different classification, restriction for examination purposes as indicated is proper.

2. During a telephone conversation with Thomas Vigil on 3/24/06 a provisional election was made with traverse to prosecute the invention of the process and apparatus, claims 1-17. Affirmation of this election must be made by applicant in replying to this Office action. Claims 18-19 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

The applicant's attention is directed to MPEP § 806.05(f), which states "A product defined by the process by which it can be made is still a product claim (*In re Bridgeford*, 357 F.2d 679, 149 USPQ 55 (CCPA 1966)) and can be restricted from the process if the examiner can demonstrate that the product as claimed can be made by another materially different process; defining the product in terms of a process by which it is made is nothing more than a permissible technique that applicant may use to define the invention."

3. Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one

Art Unit: 1754

or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

### *Drawings/Specification*

There are a number of discrepancies between the drawings and the specification that require correction.

4. Figures 1-3 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). Replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures.
5. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include the following reference sign(s) mentioned in the description: Several figures are lacking reference numbers that are mentioned in the specification. Correction is required.
6. The drawings are objected to under 37 CFR 1.83(a) because they fail to show several details as described in the specification. Specifically, figures 8 & 9 appear to be identical to figure 7. Any structural detail that is essential for a proper understanding of the disclosed invention should be shown in the drawing. MPEP § 608.02(d).

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

***Claim Objections***

7. Claims 1, 2, 14, 15, & 16 are objected to because of the following informalities:
- Claim 1: "said reactor having" in line 4 is redundant and should be deleted
  - Claim 2: commas should be inserted around the phrase "which controls a vortex strength"
  - Claim 14 has poor grammar and should be rewritten to, for example, "...velocity of ~~injecting fuel, or air ranging~~ ranges from..."
  - Claim 15: "ranging" should be changed to 'ranges'
  - Claim 16: the word 'the' should be inserted before "ratio", and "fall" should be changed to falls

Appropriate correction is required.

***Claim Rejections - 35 USC § 112***

8. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 3 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 3 recites the limitation "...injection of combustion gases and air axially and tangentially is..." There is insufficient antecedent basis for this limitation in the claim. No prior mention of injecting axially or tangentially is present. The examiner suggests rewording the claim to something like "...injection of combustion gases and air is made axially and tangentially through separate inlets."

***Claim Rejections - 35 USC § 102***

9. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

Art Unit: 1754

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

10. Claims 1, 3-12, & 16-17 are rejected under 35 U.S.C. 102(b) as being anticipated by Vanderveen (4,341,750).

Claims 1 & 3-10: Vanderveen teaches a carbon black reactor with a feedstock inlet, multiple tangential inlets and 3 axial inlets. The axial inlets, one each for feed, fuel and air, are shown in Figure 6 (see Column 4). Multiple tangential inlets are also shown and fuel is injected at one or more tangential inlets (see part 20 in Figure 1). Air is also injected tangentially (Column 2), as well as other compositions (part 21 in Figure 1). The current claims require 7 total inlets, including at least 2 tangential inlets. It is clear that Vanderveen teaches at least 4 tangential inlets in column 2. Even though having 2 separate tangential air inlets is not taught, other tangential inlets (part 21, Fig 1) could serve as air inlets. With respect to the limitations reciting function and operation, claims directed to an apparatus must be distinguished from the prior art in terms of structure rather than function or manner of operation (see MPEP § 2114). Vanderveen meets the structural requirements of claims 1 & 3-10 as described above.

Claims 11-12: Vanderveen teaches a carbon black process that includes feedstock introduction along the center of the reactor, introducing both air and fuel axially and tangentially, and separately controlling the introduction of the tangential and axial gases by controlling the flow rate of each through injection valves, which would inherently control injection velocity and quantity (Columns 2 & 4).

Claim 16: Vanderveen teaches controlling the axial portion of the volume flow at 0-70% of the total (axial + volume). Changing the volume flow would change the velocity of the injection to the reactor. An axial to tangential velocity ratio of 0.1-5.3 would correspond to and be met by an axial portion volume flow in the range of 0-70% (ratio of 0-2.33), since the two flows contain the same compound.

Claims 10 & 17: Vanderveen does not use potassium and therefore meets the limitation of "substantially reduced" use of such.

Art Unit: 1754

11. Claims 1 & 3-10 are rejected under 35 U.S.C. 102(b) as being anticipated by Cheng (4,729,885).

Cheng teaches a carbon black reactor with an axial feedstock inlet, multiple tangential inlets and multiple axial inlets (Figure 1). The current claims require at least 7 total inlets, 2 of which being tangential inlets (claims 5 & 7, which do not depend on each other, each require 2 tangential inlets and the 7 total required by claim 1). Cheng teaches 2 tangential inlets and 4 axial, giving a total of 7. With respect to the limitations reciting function and operation, claims directed to an apparatus must be distinguished from the prior art in terms of structure rather than function or manner of operation (see MPEP § 2114). Cheng meets the structural requirements of claims 1 & 3-10 as described above.

Claim 10: Cheng does not use potassium and therefore meets the limitation of “substantially reduced” use of such.

***Claim Rejections - 35 USC § 103***

12. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

13. Claims 14-15 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Vanderveen (4,341,750).

Vanderveen teaches a process for making carbon black as described above with respect to claim 11, but does not explicitly teach the injection velocities of the inlet gases. The claimed ranges are deemed met because the range encompasses flow rates expected by gas injection schemes of the reference due to the similarity of the references to the geometry of the current disclosure. In the case that these ranges are not met, it would have been obvious to one of ordinary skill in the art at the time the invention

Art Unit: 1754

was made to optimize the injection velocities, since it has been held that discovering an optimum value or a result effective variable involved only routine skill in the art. In re Boesch, 617 F. 2<sup>nd</sup> 272, 205 USPQ 215 (CCPA 1980). The artisan would have been motivated to optimize the injection velocities by the reasoned explanation that Vanderveen clearly teaches the importance of the control of the tangential and radial injection of air and fuel to the reactor for the control of carbon black product properties.

14. Claims 11 & 14-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cheng (4,729,885).

Claim 11: Cheng teaches a process for making carbon black in which fuel and air can both be injected into the reactor axially and tangentially (Columns 1 & 2). Cheng also controls the velocity of the streams separately, which would inherently also control the quantity injected (discussed throughout reference).

Claims 14-16: Cheng teaches axial velocities of about 30-350 m/s and tangential velocities of about (calculated from SCFH and inlet diameter, Column 4) 6-100 m/s. This equals an axial to tangential velocity ratio of about 0.3+. Throughout the reference Cheng teaches the importance of controlling the velocity of all of the inlets separately in order to determine the properties of the resulting carbon black product. It would have been obvious to one of ordinary skill in the art at the time the invention was made to adjust the inlet velocities, since it has been held that discovering an optimum value or a result effective variable involved only routine skill in the art. In re Boesch, 617 F. 2<sup>nd</sup> 272, 205 USPQ 215 (CCPA 1980).

Claim 17: Cheng does not use potassium and therefore meets the limitation of "substantially reduced" use of such.

15. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Vanderveen or Cheng in view of Rollins et al. (5,264,119).



Art Unit: 1754

Vanderveen and Cheng teach a carbon black reactor as described above with respect to claim 1, but do not teach a movable axial injector. Rollins teaches a carbon black reactor with axial and tangential injection and an axial feed injector that can be moved (Columns 3 & 7). It would have been obvious to one of ordinary skill in the art at the time the invention was made to use the adjustable feed injector in the similar axial/tangential processes of Vanderveen or Cheng because, as Rollins teaches, moving the feed injector can produce carbon blacks with different desired properties.

16. Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Vanderveen in view of Smith et al. (US 2004/0071626 A1).

Vanderveen teaches a process for making carbon black as described above with respect to claim 11, but does not teach 2 tangential air inlets. Smith teaches using multiple tangential air and fuel inlets (paragraphs [0102] & [0167]) in a process similar to Vanderveen. It would have been obvious to one of ordinary skill in the art at the time the invention was made to use multiple air inlets as taught by Smith in the process of Vanderveen as Smith itself explains doing so results in complete and swift combustion.

17. Claims 12-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cheng as applied to claim 11 above, and further in view of Smith et al. (US 2004/0071626 A1).

Cheng teaches a process for making carbon black as described above with respect to claim 11, but does not teach 2 tangential air or fuel inlets. Smith teaches using multiple tangential air and fuel inlets (paragraphs [0102] & [0167]) in a process similar to Cheng. It would have been obvious to one of ordinary skill in the art at the time the invention was made to use multiple air inlets as taught by Smith in the process of Cheng as Smith itself explains doing so results in complete and swift combustion.

Art Unit: 1754

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Alvin T. Raetzsch whose telephone number is 571-272-8164. The examiner can normally be reached on 9-5 M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stanley Silverman can be reached on 571-272-1358. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

ATR



STUART L. HENDRICKSON  
PRIMARY EXAMINER